

Patent claims

1. A membrane for a fuel cell comprising at least one porous, non-ion-conducting material and at least one ion-conducting electrolyte which is arranged in and fills the pores, characterized in that the at least one ion-conducting electrolyte is a polymeric electrolyte which has a higher melting point or decomposition point than the porous, non-ion-conducting material.
2. The membrane as claimed in claim 1, characterized in that the polymeric, ion-conducting electrolyte has a melting point or decomposition point which is at least 15°C higher than the porous, non-ion-conducting material, preferably a melting point or decomposition point which is 20 to 80°C higher.
3. The membrane as claimed in claim 1 or 2, characterized in that the porous, non-ion-conducting material has a melting point in the range from 125 to 250°C, preferably in the range from 130 to 180°C.
4. The membrane as claimed in one of claims 1 to 3, characterized in that the porous, non-ion-conducting material is an organic polymer, preferably a thermoplastic, particularly preferably a polyolefin, polystyrene, polyvinylidene fluoride, polysulfone, polyvinyl chloride, polyvinyl fluoride, polyamide, polyethylene terephthalate, polyoxymethylene, polycarbonate or mixtures, copolymers or combinations thereof.
5. The membrane as claimed in one of claims 1 to 4, characterized in that the polymeric, ion-conducting electrolyte is substantially an ionomer comprising sulfonic acid, phosphonic acid and/or carboxylic acid groups, polyperfluorocarbosulfonic acid, sulfonated polyethylene oxide, polybenzimidazole/phosphoric acid blend, sulfonated polysulfone, sulfonated polyether sulfone, sulfonated polystyrene, sulfonated perfluorovinylene ether, sulfonated polyether ketone, sulfonated polyolefin or mixtures or copolymers thereof.

6. The membrane according to one of claims 1 to 5, characterized in that the porous, non-ion-conducting material has a structure comprising one or more layers, preferably three layers.
7. The use of the membrane as claimed in one of claims 1 to 6 in membrane electrode assemblies (MEAs) for electrochemical cells, preferably for fuel cells.